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Patricia A. Rubio

Attorney Docket No.: 100794-11371 (FUJH 16.870)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

Appellant(s)	:	Akihiro YAMORI Takashi HAMANO Kiyoshi SAKAI Kouji YAMADA
Serial No.	:	09/526,619
Filed	:	March 16, 2000
For	:	*Moving Pictures Encoding Method and Apparatus*
Examiner	:	Y. Young Lee
Group Art Unit	:	2613

December 12, 2005

BRIEF FOR APPELLANTS

Board of Patent Appeals and Interferences
Assistant Commissioner for Patents
Washington, D.C., 20231

Sir:

A Notice of Appeal was filed on October 7, 2005. Appellants hereby petition for a one-month extension of time, a petition pursuant to 37 C.F.R. 1.136(a) and authorization to charge the requisite fee being enclosed. Appellants hereby appeal to the Board of Patent Appeals and Interferences from the Examiner's Decision, in the Official Action dated April 11, 2005, finally

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rejecting claims 23-28, and from the Advisory Action dated August 29, 2005. All requisite fees, including those for this Brief set forth in 37 C.F.R. §41.20(b)(2), may be charged to Deposit Account No. 50-1290.

(i) Real party in interest

The real party in interest is Fujitsu Limited, a Japanese corporation with offices at 1-1, Kamikodaka 4-chome, Nakahara-Ku, Kawasaki-shi, Kanagawa, Japan, to which Appellants have assigned all interest in, to and under this application, by virtue of an assignment as recorded at Reel 010634, Frame 0778 of the Assignment records of the U.S. Patent and Trademark Office.

(ii) Related appeals and interferences

Upon information and belief, there are no other appeals or interferences, which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

(iii) Status of claims

The application was filed on March 16, 2000. Foreign priority benefits under 35 U.S.C. §119 were claimed based on Japanese application 11-074497 filed on March 18, 1999. The application was filed with claims 1-20.

In a preliminary amendment, filed March 16, 2000, Appellants added claims 21 and 22.

In a first office Action dated May 22, 2003, the Examiner issued a restriction requirement.

In a response to the first Office Action, filed June 20, 2003, Appellants elected claim 4 for prosecution. As a result, claims 1-3 and 5-22 were withdrawn from consideration.

In a second Office Action dated July 16, 2003, claim 4 was objected to for informalities and rejected under 35 U.S.C. § 102(a) as being anticipated by Appellants' Admitted Prior Art ("AAPA").

In a response to the Office Action filed December 15, 2003, Appellants amended claim 4.

In a final Office Action dated March 12, 2004, claim 4 was rejected under 35 U.S.C. § 102(a) as being anticipated by AAPA.

In a response to the final Office Action filed concurrently with a Request for Continued Examination ("RCE") on August 9, 2004, Appellants canceled claim 4 and added new claims 23-28.

In a non-final Office Action dated September 10, 2004, claim 26 was objected to for informalities and claims 23-28 were rejected under 35 U.S.C. § 102(a) as being anticipated by AAPA.

In a response to the Office Action filed March 3, 2005, Appellants amended claims 23 and 26.

In a final Office Action dated April 11, 2005, claim 26 was objected to for informalities, claims 23-24 and 26-27 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,430,223 to Lim, and claims 25 and 28 were rejected under 35 U.S.C. 103(a) as being unpatentable over Lim in view of AAPA.

In a response to the final Office Action filed August 11, 2005, Appellants amended claim 26.

In an Advisory Action dated August 29, 2005, the Examiner indicated that Appellants' response filed on August 11, 2005 was considered. The Examiner asserted that the application was not in condition for allowance.

The status of the claims as set out in the Advisory Action is:

Claims allowed: None

Claims objected to: None

Claims rejected: 23-28

The rejected claims are set out in the Appendix attached hereto.

The rejected claims are being appealed.

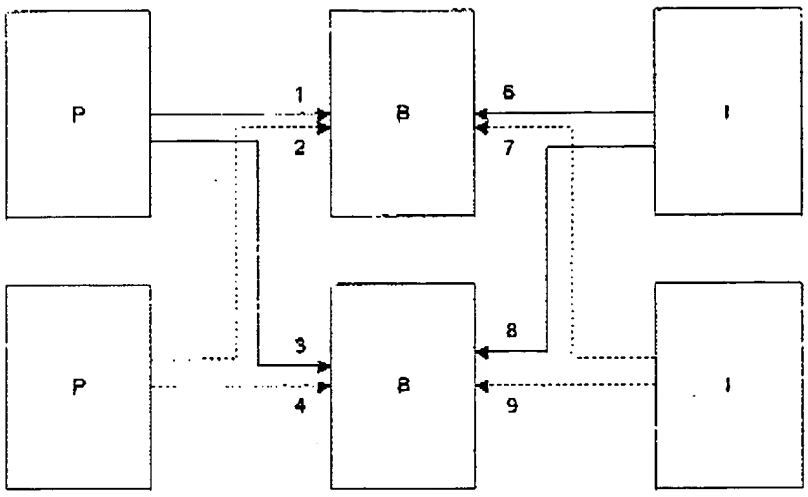
(iv) Status of amendments

Appellants' response filed on August 11, 2005, proffered after final rejection, has been considered. Appellants amended claim 26 to overcome the Examiner's objection on informalities. Appellants did not otherwise cancel or amend any of the claims that are the subject of this appeal.

(v) Summary of claimed subject matter

The claimed invention is directed to a technique for improved moving picture image data encoding, where a bidirectional picture is encoded by predicting a top field from only forward picture frames and a bottom field from only backward picture frames. This scheme reduces the amount of encoding needed while addressing the problem of quality deterioration at scene changes between bidirectional pictures.

Appellants present the following figure to illustrate the operations of conventional moving picture image data encoding, as discussed on pages 7-9 in the specification—referring to Fig. 31 of the application:

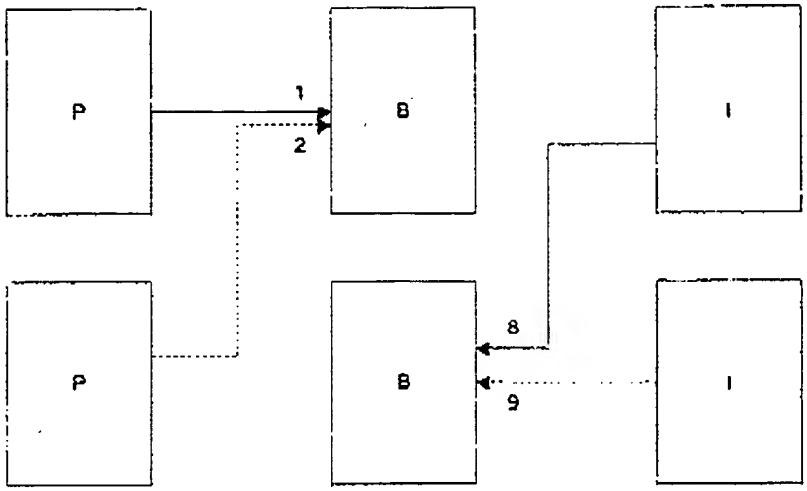


PRIOR ART

As shown above, specifically in the case of bidirectional prediction methods of the prior art, the odd field generates a reference frame by combining a forward predictive frame, which is generated using either number 1 or 2 motion vector, and a backward predictive frame, which is generated using either the number 6 or 7 motion vector. Likewise, the even field generates a reference frame by combining a forward predictive frame, generated using either the number 3 or 4 motion vector, and a backward predictive frame, which is generated using either the number 8 or 9 motion vector. Please see, for example, page 9, lines 3-14 of the specification. Since both fields of a picture B include predictive pictures combined with the forward and backward picture frames, a predictive picture may be deteriorated if a scene change occurs between the B's of a current frame.

The claimed invention solves this problem by having the feature of performing the prediction in a macro-block unit composed of (n x n) pixels, to the top field of the picture frame from either one of top and bottom fields of the forward picture frame, and the bottom field of the

picture frame from either one of top and bottom fields of the backward picture frame, as shown in the figure below.



PRESENT INVENTION

As an example of the claimed technique, prediction is possible when the odd field uses only either the number 1 or 2 motion vector AND when the even field uses only either the number 8 or 9 motion vector. Please see, for example, Fig. 1 and its corresponding description in the specification of the application.

Therefore, in one embodiment, the present invention's method comprises the steps of first predicting, in a macro-block unit composed of (n x n) pixels, the top field of the picture frame from either one of top and bottom fields of only the forward picture frame, and predicting the bottom field of the picture frame from either one of top and bottom fields of only the backward picture frame; generating a predictive picture according to the prediction; and encoding the picture frame of the input signal by using the generated predictive picture. The present invention is also directed to a moving picture encoding apparatus operable to perform the above-described moving picture image data encoding. For example, such an apparatus may comprise field

motion vector detecting means for performing first predicting in a macro-block unit composed of (n x n) pixels, the top field of the picture frame from either one of top and bottom fields of only the forward picture frame, and the bottom field of the picture frame from either one of top and bottom fields of only the backward picture frame; motion compensating means for generating a predictive picture according to the prediction; and encoding means for encoding the picture frame of an input signal using the generated predictive picture.

(vi) Grounds of rejection to be reviewed on appeal

1. Whether or not claims 23-24 and 26-27 are unpatentable under 35 U.S.C. § 102 as being anticipated by Lim.

2. Whether or not claims 25 and 28 are unpatentable under 35 U.S.C. § 103 as being obvious in view of Lim and AAPA.

(vii) Argument

Issue 1: Whether or not claims 23-24 and 26-27 are unpatentable under 35 U.S.C. § 102 as being anticipated by Lim.

(a) Claims 23-24 and 26-27 are patentable over Lim because Lim does not describe any method other than a conventional method that Appellants are addressing with the claimed invention.

Lim, as cited and relied upon by the Examiner, describes conventional bidirectional prediction methods no different from the prior art examples discuss in the background of the application and briefly described above. Figs. 9B, 9C, 10B, and 10C of Lim illustrate the forward and backward motion prediction of a B (bidirectional) picture used by respective first and second scalers 56 and 58 shown in Fig. 6 of Lim. In particular, Figs. 9B and 9C illustrate the forward and backward motion prediction of a B picture for scaling a first single-pixel motion

vector MVtt to obtain a fourth single-pixel motion vector MVbt by first scaler 56. Separately, Figs. 10B and 10C illustrate the forward and backward motion prediction of a B picture for scaling a second single-pixel motion vector MVbb to obtain a fifth single-pixel motion vector MVtb. Please see, e.g., col. 10, line 3 to col. 11, line 48 of Lim.

As such, Figs. 9B and 9C each show a component scaling method for doing bidirectional motion prediction—9B showing the forward motion prediction component and 9C showing the backward motion prediction component—used to obtain the motion vector MVbt. And separately, Figs. 10B and 10C each show a component scaling method for doing bidirectional motion prediction—10B showing the forward motion prediction component and 10C showing the backward motion prediction component—used to obtain the motion vector MVtb. Lim apparently separated Fig. 9B from 9C and Fig. 10B from 10C for clarity of illustration and description, where the respective scaling factors F_{s1} and F_{s2} from each prediction direction of a B picture is described. Indeed, Figs. 9A and 10A are also necessarily included in the technique described by Lim where forward motion prediction of a P (predictive) picture is also used to obtain the respective motion vectors. Lim describes that different scaling weights are used depending upon the picture type, the motion prediction direction, distance, etc. Please see, e.g., col. 11, lines 49-55 of Lim. Lim even acknowledges the large amount of calculation necessary to obtain all positions in the motion prediction area so as to provide the motion prediction. Please see, e.g., col. 11, lines 56-60 of Lim.

Lim, therefore, describes a bidirectional picture being encoded where both of the top and bottom fields are predicted from both forward and backward frames—i.e., Figs. 9B and 9C go together to illustrate B picture bidirectional motion prediction for obtaining motion vector MVbt,

and Figs. 10B and 10C go together to illustrate B picture bidirectional motion prediction for obtaining motion vector MVtb.

As such, Lim does not disclose,

> "first predicting in a macro-block unit composed of (n x n) pixels, the top field of the picture frame from either one of top and bottom fields of only the forward picture frame, and the bottom field of the picture frame from either one of top and bottom fields of only the backward picture frame;
> generating a predictive picture according to the prediction; and
> encoding the picture frame of the input signal by using the generated predictive picture," as recited in base claims 23 and 26. (Underlining added for emphasis)

Accordingly, Appellants respectfully submit that claims 23 and 26, together with claims 24 and 27 dependent therefrom, respectively, are patentable over Lim for at least the above-stated reasons.

(b) The Examiner's application of Lim in the claim rejections was improper

The Examiner isolated Figs. 9C and 10B from the rest of Lim to reject the claimed invention by clearly improper hindsight and without any basis from the reference itself. As shown above, Lim describes obtaining motion vectors MVbt and MVtb by using forward prediction of a P picture (Figs. 9A and 10A) and both forward and backward prediction of a B picture (Figs. 9B, 9C, 10B, and 10C). Lim, therefore, does not disclose any scaling method for obtaining a motion vector that uses only the backward motion prediction component of a B picture illustrated in Fig. 9C. Correspondingly, Lim does not disclose any scaling method for obtaining a motion vector that uses only the forward motion prediction component of a B picture illustrated in Fig. 10B. And Lim clearly does not disclose any method that uses only these two prediction components.

1. Lim does not provide an enabling disclosure of Examiner's proposed application of the reference

The Examiner isolated Figs. 9C and 10B from all other figures and description in Lim to reject the present application without pointing to any description in Lim that combining only the two schemes illustrated in these figures would even be operable.

MPEP 2121.01 requires the following,

> "'In determining that quantum of prior art disclosure which is necessary to declare an applicant's invention "not novel" or "anticipated" within section 102, the stated test is whether a reference contains an 'enabling disclosure"... .' *In re Hoeksema*, 399 F.2d 269, 158 USPQ 596 (CCPA 1968). *>The disclosure in an assertedly anticipating reference **must provide an enabling disclosure of the desired subject matter; mere naming or description of the subject matter is insufficient, if it cannot be produced without undue experimentation**. *Elan Pharm., Inc. v. Mayo Foundation for Medical and Education Research*, 346 F.3d 1051, 1054, 68 USPQ2d 1373, 1376 (Fed. Cir. 2003)(At issue was whether a prior art reference enabled one of ordinary skill in the art to produce Elan's claimed transgenic mouse without undue experimentation. Without a disclosure enabling one skilled in the art to produce a transgenic mouse without undue experimentation, the reference would not be applicable as prior art.).< A reference contains an 'enabling disclosure' if the public was in possession of the claimed invention before the date of invention. 'Such possession is effected if one of ordinary skill in the art could have combined the publication's description of the invention with his [or her] own knowledge to make the claimed invention.' *In re Donohue*, 766 F.2d 531, 226 USPQ 619 (Fed. Cir. 1985)."
> (Underlining added for emphasis)

As Appellants have demonstrated, Lim clearly describes a scheme where all of the motion predictions illustrate in Figs. 9A-C and 10A-C are required to obtain motion vectors MVbt and MVtb, respectively. There is no enabling disclosure in Lim for any scheme where only the motion predictions illustrated in Figs. 9C and 10B are used to generate a predictive picture. The Examiner's § 102 rejection is, therefore, improper.

Even assuming, arguendo, that the Examiner may rely upon each of Figs. 9C and 10B as individual drawings that are completely isolated from the rest of Lim, these figures do not provide adequate disclosure to enable one skilled in the art to produce the claimed invention.

2. Figs. 9C and 10B, by themselves, do not provide adequate disclosure to yield the claimed invention

Appellants acknowledge that pictures and drawings may provide enabling disclosures, as enumerated in the following sections of the MPEP:

> MPEP 2121.04
>
> "Pictures and drawings may be sufficiently enabling to put the public in the possession of the article pictured. Therefore, such an enabling picture may be used to reject claims to the article. However, the picture must show all the claimed structural features and how they are put together. *Jockmus v. Leviton*, 28 F.2d 812 (2d Cir. 1928). See also MPEP § 2125 for a discussion of drawings as prior art." (Underlining added for emphasis)
>
> MPEP 2125
>
> "Drawings and pictures can anticipate claims if they clearly show the structure which is claimed. *In re Mraz*, 455 F.2d 1069, 173 USPQ 25 (CCPA 1972). However, the picture must show all the claimed structural features and how they are put together. *Jockmus v. Leviton*, 28 F.2d 812 (2d Cir. 1928). ... The drawings must be evaluated for what they reasonable disclose and suggest to one of ordinary skill in the art. *In re Aslanian*, 590 F.2d 911, 200 USPQ 500 (CCPA 1979).

Even assuming that the Examiner is relying upon Figs. 9C and 10B as "enabling pictures," they do not provide adequate disclosure to yield the claimed invention. As stated in the above-quoted sections of the MPEP, all features must be shown in an enabling picture. Figs. 9C and 10B merely illustrate respective forward and backward motion prediction components that do not include any structure for implementing the methods or provide any description or suggestion that either would be operable individually or in combination with each other to yield

a desirable predictive picture. Indeed, the Examiner relies upon other figures in Lim as disclosure of the structural components for implementing the prediction, predictive picture generation, and picture encoding. It is, therefore, clear that Figs. 9C and 10B, by themselves, cannot provide an enabling disclosure to yield the claimed invention.

Furthermore, the claimed invention is not obvious in view of Lim or the portions thereof cited by the Examiner.

3. The claimed invention is not obvious in view of Lim or the portions thereof cited by the Examiner.

Appellants refer to In re Fritch, (23 USPQ 2d 1780-CAFC 1992) in which the Court states at page 1783:

> "'Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under section 103, teachings of references can be combined *only* if there is some suggestion or incentive to do so'. Although couched in terms of combining teachings found in the prior art, the same inquiry must be carried out in the context of a purported obvious 'modification' of the prior art. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification....It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that '[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention". (Underlining added for emphasis)

There is no disclosure or suggestion in Lim that the isolation of the schemes illustrated in Figs. 9C and 10B thereof would be desirable or even operable for producing a predictive picture. The Examiner has clearly used the claimed invention as a manual and template to piece together these figures—and disregarding the remainder of Lim—to reject the claimed invention.

The claimed invention, as recited in base claims 23 and 26, is therefore not anticipated by nor is it even obvious in view of Lim. Accordingly, Appellants respectfully submit that claims 23 and 26, together with claims 24 and 27 dependent therefrom, respectively, are patentable over Lim and any cited portions thereof for at least the above-stated reasons.

Issue 2: Whether or not claims 25 and 28 are unpatentable under 35 U.S.C. § 103 as being obvious in view of Lim and AAPA.

Claims 25 and 28 depend from claims 23 and 26, respectively, and are patentable for at least the above-stated reasons. The Examiner relied upon AAPA as a combining reference for specifically addressing additional features recited in dependent claims 25 and 28. As such, AAPA would not cure the above-described deficiencies of Lim and the cited portions thereof even if it would have been obvious to one skilled in the art to combine the references in the manner proposed by the Examiner. Appellants, therefore, respectfully submit that claims 25 and 28 are patentable for at least this reason.

Furthermore, the Examiner's application of AAPA was improper. The Examiner acknowledged that Lim does not disclose "detecting if there is a scene change between the top and bottom fields of the picture frame of the input signal." Page 4, lines 17-19 of the April 11, 2005 final Office Action. The Examiner relied upon AAPA as a combining reference that allegedly discloses this feature.

Figs. 28-31 and their corresponding description in the specification of the application, which comprise the portion of AAPA that the Examiner was presumably referring to in the Office Action, merely illustrate how conventional moving picture image data encoding methods have disadvantages and problems when there is a scene change (SC) at a particular point. The

Examiner does not cite any particular part of AAPA where actual detection of such a SC occurs in a conventional method. Appellants demonstrate in the background section of the application how a SC may affect the performance and outcome of these conventional methods. Therefore, there is no description or suggestion in AAPA that any conventional method includes the claimed "detecting if there is a scene change between the top and bottom fields of the picture frame of the input signal."

In view of the foregoing, it is respectfully submitted that claims 25 and 28 are patentable over Lim and AAPA for at least the above-stated reasons.

CONCLUSION

Claims 23-24 and 26-27 are not anticipated by Lim, and claims 25 and 28 are not obvious in view of Lim and AAPA. Accordingly, it is respectfully submitted that the Examiner erred in rejecting claims 23-28 and a reversal of such rejections by this Honorable Board is solicited.

Respectfully submitted,

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(viii) **Claims Appendix**

23. A moving pictures encoding method for encoding a picture frame of an input signal by predicting from both forward and backward picture frames, the picture frame having top and bottom fields, which respectively include odd numbers and even numbers of pixel scanning lines of the picture frame, the method comprising the steps of:

first predicting in a macro-block unit composed of (n x n) pixels, the top field of the picture frame from either one of top and bottom fields of only the forward picture frame, and the bottom field of the picture frame from either one of top and bottom fields of only the backward picture frame;

generating a predictive picture according to the prediction; and

encoding the picture frame of the input signal by using the generated predictive picture.

24. The moving pictures encoding method according to claim 23, further comprising the steps of:

second predicting in the macro-block unit, the top and bottom fields of the picture frame from both the forward and backward picture frames; and

selectively performing the first predicting.

25. The moving pictures encoding method according to claim 24, further comprising the step of detecting if there is a scene change between the top and bottom fields of the picture frame of the input signal; and wherein when the scene change is detected, the first predicting is performed.

26. A moving pictures encoding apparatus, in which a picture frame of an input signal is encoded by predicting from both forward and backward picture frames, the picture frame having top and bottom fields, which respectively include odd numbers and even numbers of pixel scanning lines of the picture frame, the moving pictures encoding apparatus comprising:

field motion vector detecting means for performing first predicting in a macro-block unit composed of (n x n) pixels, the top field of the picture frame from either one of top and bottom fields of only the forward picture frame, and the bottom field of the picture frame from either one of top and bottom fields of only the backward picture frame;

motion compensating means for generating a predictive picture according to the prediction; and

encoding means for encoding the picture frame of an input signal using the generated predictive picture.

27. The moving pictures encoding apparatus according to claim 26, further comprising prediction mode selecting means for selecting whether or not second predicting in the macro-block unit, the top and bottom fields of the picture frame from both the forward and backward picture frames; and selectively performing the first predicting.

(ix) Evidence Appendix

No evidence was submitted to or entered by the Examiner during prosecution of this application.

(x) **Related Proceedings Appendix**

Upon information and belief, there are no other appeals or interferences, which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.